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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CLIFFORD EARL SHAMBLEN,
ANDREW PHILIP WOODFIELD,
ERIC ALLEN OTT, and
MICHAEL FRANCIS XAVIER GIGLIOTTI

Appeal 2008-4932
Application 10/814,896
Technology Center 1700

Decided:¹ March 6, 2009

Before BRADLEY R. GARRIS, CATHERINE Q. TIMM, and
JEFFREY T. SMITH, *Administrative Patent Judges*.

GARRIS, *Administrative Patent Judge*.

DECISION ON APPEAL

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the Decided Date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

Appellants appeal under 35 U.S.C. § 134 from the Examiner's decision rejecting claims 1-26. We have jurisdiction under 35 U.S.C. § 6.

We AFFIRM for the reasons expressed in the Answer and below.

STATEMENT OF THE CASE

Appellants claim a method for preparing an article of iron base metal alloyed with an alloying element comprising the steps of providing and mixing a chemically reducible nonmetallic base-metal precursor compound of the iron base metal and a chemically reducible nonmetallic alloying-element precursor compound which is thermophysically melt incompatible with the iron base metal, chemically reducing the mixture to a metallic alloy without melting the alloy, and thereafter consolidating the metallic alloy to produce a consolidated metallic article without melting the alloy or article (claims 1, 14, 26). The article is a martensitic-composition steel (claims 1, 26) which is capable of being heat treated to produce a certain structure such as a continuous body-centered cubic structure matrix phase which is present in an acicular phase morphology (claim 1). In addition to being a martensitic-composition steel, the article also may be post-processed to actually form a martensitic article having certain structures such as the previously recited structure (claim 14).

Representative independent claims 1, 14, and 26, as reproduced from the Claims Appendix of Appellants' Brief, read as follows:

1. A method for preparing an article of iron base metal alloyed with an alloying element, comprising the steps of:

providing a chemically reducible nonmetallic base-metal precursor compound of the iron base metal;

providing a chemically reducible nonmetallic alloying-element precursor compound of an alloying element, wherein the alloying element is thermophysically melt incompatible with the iron base metal; thereafter

mixing the base-metal precursor compound and the alloying-element precursor compound to form a compound mixture; thereafter

chemically reducing the compound mixture to a metallic alloy, without melting the metallic alloy; and thereafter

consolidating the metallic alloy to produce a consolidated metallic article, without melting the metallic alloy and without melting the consolidated metallic article, wherein the consolidated iron-base metallic article is a martensitic-composition steel that is capable of being heat treated to produce a structure having a continuous body-centered cubic or body-centered tetragonal crystal structure matrix phase wherein at least about 75 percent by volume of the body-centered cubic or body-centered tetragonal crystal structure matrix phase is present in an acicular phase morphology.

14. A method for preparing an article made of iron base metal alloyed with an alloying element, comprising the steps of

providing a chemically reducible nonmetallic base-metal precursor compound of the iron base metal;

providing a chemically reducible nonmetallic alloying-element precursor compound of an alloying element that is thermophysically melt incompatible with the iron base metal; thereafter

mixing the base-metal precursor compound and the alloying-element precursor compound to form a compound mixture; thereafter

chemically reducing the compound mixture to produce a metallic alloy, without melting the metallic alloy; thereafter

consolidating the metallic alloy to produce a consolidated metallic article, without melting the metallic alloy and without melting the consolidated metallic article, wherein the consolidated iron-base metallic article is a martensitic-composition steel; and

post-processing the consolidated metallic article by heat treating the consolidated metallic article to form a martensitic article, wherein the martensitic article includes a body-centered cubic phase or a body-centered tetragonal matrix phase, and wherein at least about 75 percent by volume of the body-centered cubic phase or the body-centered tetragonal matrix phase is present in an acicular phase morphology.

26. A method for preparing an article of iron base metal alloyed with an alloying element, comprising the steps of

providing a chemically reducible nonmetallic base-metal precursor compound of the iron base metal;

providing a chemically reducible nonmetallic alloying-element precursor compound of an alloying element, wherein the alloying element is thermophysically melt incompatible with the iron base metal and is selected from the group consisting of barium, calcium, cadmium, cerium, lithium, magnesium, manganese, zinc, aluminum, arsenic, copper, hafnium, lanthanum, tin, boron, gadolinium, rhenium, phosphorus, silicon, thorium, yttrium, zirconium, oxygen, sulfur, silver, indium, beryllium, antimony, and scandium; thereafter

mixing the base-metal precursor compound and the alloying-element precursor compound to form a compound mixture; thereafter

chemically reducing the compound mixture to a metallic alloy, without melting the metallic alloy; and thereafter

consolidating the metallic alloy to produce a consolidated metallic article, without melting the metallic alloy and without melting the consolidated metallic article, wherein the consolidated iron-base metallic article is a martensitic-composition steel.

The following references are relied upon by the Examiner as evidence of anticipation, obviousness, and obviousness-type double patenting (Ans. 8-10):

Armstrong	US 5,958,106	Sep. 28, 1999
Fray et al. (Fray '952)	US 6,712,952 B1	Mar. 30, 2004
Ishibachi (as translated)	JP 57-164958	Oct. 9, 1982
Fray (WO '638)	WO 9964638	Dec. 16, 1999

Bhadeshia, "Martensite and Martensitic Phase Transformation", *Materials Science & Metallurgy*, University of Cambridge,
<http://www.msm.cam.ac.uk/phase-trans/2002/martensite.html> (UOC)

The claims of US 6,926,754 B2 to Shamblen et al. (Shamblen) (Aug. 9, 2005).

The Examiner rejects the appealed claims as follows.

Based on anticipation and obviousness:

- (1) Claims 1, 2, 4-7, 9, 11, 12, and 14-23 are rejected under 35 U.S.C. § 102(b) as being anticipated by Ishibachi (Ans. 3-6);
- (2) Claims 13 and 24-26 are rejected under 35 U.S.C. § 102(b) as being anticipated by Ishibachi (Ans. 6);
- (3) Claim 8 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Ishibachi in view of Fray WO '638 or Fray US '952 (Ans. 6-7); and
- (4) Claims 3 and 10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ishibachi in view of Armstrong (Ans. 7-8).

Based on obviousness-type double patenting:

- (5) Claims 1-4 and 6-9 are rejected as being unpatentable over the claims of Shamblen;
- (6) Claims 14-20 are rejected as being unpatentable over the claims of Shamblen in view of UOC;
- (7) Claims 5, 11, and 12 are rejected as being unpatentable over the claims of Shamblen in view of Ishibachi;

(8) Claim 10 is rejected as being unpatentable over the claims of Shamblen in view of Ishibachi and Armstrong;

(9) Claims 21-23 are rejected as being unpatentable over the claims of Shamblen in view of UOC and Ishibachi;

(10) Claim 13 is rejected as being unpatentable over the claims of Shamblen in view of Ishibachi; and

(11) Claims 24-26 are rejected as being unpatentable over the claims of Shamblen in view of Ishibachi.

THE § 102 REJECTIONS

ISSUE

Have Appellants shown reversible error in the Examiner's finding that Ishibachi expressly or inherently discloses the limitations required by the rejected claims?

FINDINGS OF FACT

The Examiner finds that Ishibachi teaches the providing, mixing, reducing, and consolidating steps of independent claims 1, 14, and 26 (Ans. 3-6; Ishibachi claim (1) at 2, Working Example (1) at 13-15, last para. at 18).

As for the post-processing step of independent claim 14, the Examiner finds that Ishibachi's post-processing step would inherently produce the claimed matrix phase and morphology (Ans. 4, 11; Ishbachi claim (1) at 2).

PRINCIPLES OF LAW

A claim is anticipated if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros., Inc. v. Union Oil*, 814, F.2d 628, 631 (Fed. Cir. 2002).

When the Patent and Trademark Office (PTO) shows a sound basis for believing that the products of the applicant and the prior art the same, the applicant has the burden of showing that they are not. *In re Spada*, 911 F.2d 705, 709 (Fed. Cir. 1990).

Where the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of the claimed product. *In re Best*, 562 F.2d 1252, 1255 (CCPA 1977).

ANALYSES

Concerning independent claims 1 and 14, Appellants argue that Ishibachi does not disclose a martensitic article having a body-centered cubic phase or a body-centered tetragonal matrix phase wherein at least about 75% by volume of the matrix phase is present in an acicular phase morphology (Br. 6-9).

Appellants' argument is unpersuasive with respect to claim 1 because this claim is not limited to a martensitic article having such matrix phase or morphology features. Instead, claim 1 simply requires an article which "is a martensitic-composition steel that is capable of being heat treated to produce a structure having" (emphasis added) the above argued features. It is reasonable to believe that Ishibachi's article possesses this claim 1 capability since the method steps and compositions of Ishibachi correspond to those recited in Appellants' claim 1 as correctly found by the Examiner (Ans. 4-11). Appellants to do not even assert, much less explain why, Ishibachi's article would not possess the capability required by claim 1.

As for claim 14, Ishibachi's method claim (1) expressly recites that the article manufactured thereby possesses a martensitic matrix and thereby vitiates

Appellants' argument to the contrary. Furthermore, the Examiner's finding discussed in the immediately preceding paragraph reasonably supports a determination that Ishibachi's article would inherently and necessarily possess the matrix phase and morphology required by claim 14.

According to Appellants, "Figures 1-2 of JP '958 [i.e., Ishibachi], which depict the structure resulting from [Working] Example 1 of JP '958, do not evidence the recited acicular microstructure [of claim 14]" (Br. 9). However, as correctly pointed out by the Examiner (Ans. 11), Appellants' afore-quoted assertion is not supported by factual evidence of record. As such, the assertion fails to establish error in the Examiner's contrary determination based on inherency.

Regarding independent claim 26, Appellants argue that the claim requires a precursor compound of an alloying element such as manganese whereas Ishibachi refers only to metallic manganese (i.e., as an impurity in Working Example (1)) rather than a precursor thereof. The deficiency of this argument is that it fails to rebut or even acknowledge the Examiner's finding that the manganese impurity listed in Working Example (1) of Ishibachi would be present in a compound, rather than pure, form such as manganese oxide (Ans. 13). In light of this deficiency, Appellants' argument fails to establish error in the Examiner's finding that claim 26 is anticipated by Ishibachi.

Finally, Appellants' discussions of the dependent claims under rejection are limited to a reiteration of the limitation recited therein followed by an unembellished statement that Ishibachi has no such disclosure. For example, see the discussion of dependent claim 15 (Br. 10). Significantly, these discussions do not address much less rebut the Examiner's detailed rationale for rejecting the dependent claims. For example, see the Examiner's rationale that

the manganese of Ishibachi's Working Example (1) would inherently possess the vapor pressure characteristic of claim 15 (Ans. ¶ bridging 4-5, first full ¶ at 12). This rationale is reasonable on its face since Appellants disclose manganese as an alloying element which possesses the claim 15 characteristic (Spec. 8 at ¶ [0016]).

Under these circumstances, the dependent claim discussions by Appellants can not be regarded as arguments which establish error by the Examiner in rejecting such claims.

CONCLUSIONS OF LAW

Appellants have not shown reversible error in the Examiner's finding that Ishibachi expressly or inherently discloses the limitations required by the rejected claims.

Therefore, we sustain the Examiner's § 102 rejection of claims 1, 2, 4-7, 9, 11, 12, and 14-23 and of claims 13 and 24-26.

THE § 103 REJECTIONS

ISSUE

Have Appellants shown error in the Examiner's conclusions of obviousness?

FINDINGS OF FACT

The Examiner concedes that Ishibachi fails to disclose the steps recited in claim 8 (Ans. 6) as well as claims 3 and 10 (Ans. 7).

The Examiner finds that Fray WO '638 and Fray US '952 disclose chemically reducing a compound mixture by fused salt electrolysis as required by claim 8 (Ans. 6-7, 13-14; Fray WO '638, Abstract; Fray US '952 Abstract, col. 4, ll. 18-25).

The Examiner finds that Armstrong discloses a method of producing a metal alloy which comprises introducing a halide vapor of the metal into a liquid alkali or alkaline earth metal to thereby produce the desired alloy (Armstrong, Abstract, claim 8, col. 2, ll. 34-54), thereby suggesting providing precursor compounds in gaseous form as required by claim 3 and chemically reducing a compound mixture by contact with liquid alkali metal or alkaline earth metal as required by claim 10 (Ans. 7-8, 14-15).

PRINCIPLES OF LAW

In assessing the obviousness of a claim to a combination of prior art elements, the question to be asked is whether the improvement of the claim is more than the predictable use of prior art elements according to their established functions. *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740 (2007). Moreover, the obviousness analysis need not seek out precise teachings directed to the specific subject matter of the claim, for the analysis can take account of the inferences and creative steps that a person of ordinary skill in the art would employ. *Id.*, 127 S. Ct. at 1741.

For a § 103 rejection which is based on a combination of references, the test for obviousness is what the combined teachings of the references would have suggested to those of ordinary skill in the art. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). Therefore, nonobviousness cannot be established by attacking references individually where the rejection is based on a combination of references. *Id.*, 642 F.2d at 426.

ANALYSES

Appellants argue that the Examiner's proposed combinations of Ishibachi with the Fray references in rejecting claim 8 and with Armstrong in rejecting

claims 3 and 10 are improper because (1) there is no objective basis for combining the reference teachings, (2) there is no reasonable expectation of success, and (3) the applied references do not teach certain claim limitations (Br. 15-18).

These arguments fail to show error in the rejections under consideration. This is because the arguments are incorrectly premised on the reference teachings considered individually rather than what the combined teachings of the references would have suggested to an ordinary artisan and what inferences and creative steps such an artisan would employ.

For example, Appellants argue that the advantages taught by the Fray and Armstrong references are disclosed as being relative to prior art approaches rather than Ishibachi's approach and therefore provide no basis for combining the reference teachings based upon a reasonable expectation of success (Br. 15, 17). Similarly, Appellants argue that none of the applied references teaches the dependent claim limitations in the context of an iron base metal precursor compound as required by parent independent claim 1 (Br. 16, 18). However, these arguments beg the issue of what the combined teachings of the references would have suggested and what inferences and creative steps an artisan would employ based on these combined teachings.

Here, the applied references evince that the features of independent claim 1 and the features of the rejected dependent claims are known in the prior art. Further, the Examiner's proposed combination of these prior art features appears to result in an improvement that is no more than the predictable use of these prior art features according to their established functions. Certainly, Appellants have not established in the record before us that the claims under review yield

an improvement which is more than is predictable from the prior art. These circumstances favor a conclusion of obviousness rather than nonobviousness.

CONCLUSIONS OF LAW

Appellants have not shown reversible error in the Examiner's conclusions of obviousness.

As a consequence, we sustain the Examiner's § 103 rejections of claim 8 over Ishibachi in view of Fray WO '638 or Fray US '952 and of claims 3 and 10 over Ishibachi in view of Armstrong.

THE OBVIOUSNESS-TYPE DOUBLE PATENTING REJECTIONS

ISSUE

Have Appellants shown reversible error in the Examiner's conclusion that the rejected claims are unpatentable under obviousness-type double patenting based on the claims of the Shamblen patent?

FINDINGS OF FACT

The Examiner finds that claim 1 of Shamblen is identical to Appellants' claim 1 in all respects except that Appellants' claim 1 method is specific to iron base metal whereas Shamblen's claim 1 method is directed to a Markush group of five base metals including iron (Ans. 8, 15-16).

Based on this finding, the Examiner determines that the method of appealed claim 1 and the article characteristics produced by this method are encompassed within the scope of claim 1 of the Shamblen patent (*id.*).

With respect to Appellants' independent claim 14 (as well as certain dependent claims), the Examiner also finds that the UOC reference would have suggested post-processing the iron base metal alloy of Shamblen's claimed

method in order to form a martensitic article having the desirable properties of strength and toughness associated with martensitic steel (Ans. 9).

The Examiner's findings concerning Ishibachi and Armstrong (Ans. 9-10) correspond to the findings for these references which have been discussed previously.

PRINCIPLES OF LAW

A rejection based upon double patenting of the obviousness-type is a judicially created doctrine grounded in public policy to prevent patent term extension by prohibiting the issuance of claims in a second patent which are not patentably distinct from the claims in a first patent. *In re Longi*, 759 F.2d 887, 892 (Fed. Cir. 1985). An obviousness-type double patenting rejection is analogous to a § 103 rejection and therefore a proper analysis of the former parallels guidelines for the latter. *Id.*, at footnote 4.

Because the analytical guidelines for an obviousness-type double patenting rejection parallel those for a § 103 rejection, we incorporate herein the principles of law expressed in the section of this opinion which addresses the § 103 rejections on appeal.

ANALYSES

Concerning the rejection of claims 1-4 and 6-9, Appellants present arguments for independent claim 1 only. Dependent claims 2-4 and 6-9 are not separately argued. According to Appellants, Shamblen's claim 1 method is directed to making a super alloy having a face-centered cubic crystal structure and distributed discrete phases (Br. 18-19). Appellants argue that such structure and discrete phases are the antithesis of the crystal structure and acicular phase morphology required by appealed claim 1 (Br. 19, 21).

These arguments are not well taken for two reasons. First, claim 1 of the Shamblen patent is not limited in any of the respects argued by Appellants. Instead, Shamblen's claim 1 broadly defines a "method for preparing an article of a base metal alloy with an alloying element" which comprises the base metal, alloying element and steps required by Appellants' claim 1. Second, contrary to Appellants' apparent belief, appealed claim 1 is not limited to a martensitic article having a particular matrix phase structure or phase morphology. As previously explained, Appellants' claim 1 simply requires "a martensitic-composition steel that is capable of being heat treated to produce" (emphasis added) the recited crystal structure matrix phase and acicular phase morphology. Moreover, the correspondence of Shamblen's claim 1 method with Appellants' claim 1 method provides a reasonable basis for believing that the former possesses the same capabilities as the latter. On this record, Appellants have failed to carry their burden of showing error in this belief.

With respect to the other rejections under consideration, Appellants argue that the Examiner's proposed combinations of Shamblen's claimed method with the teachings of the variously applied references are improper. According to Appellants, this is because (1) there is no basis for these proposed combinations, (2) there is no expectation of success, and (3) there is no teaching of the rejected claim limitations (Br. 21-31).

These arguments correspond to those unsuccessfully advanced against the § 103 rejections on appeal. It follows that these arguments are also unsuccessful for reasons analogous to those expressed above.

CONCLUSIONS OF LAW

Appellants have not shown reversible error in the Examiner's conclusion that the rejected claims are unpatentable under obviousness-type double patenting based on the claims of the Shamblen patent.

For this reason, we sustain the following obviousness-type double patenting rejections:

The rejection of claims 1-4 and 6-9 over the claims of Shamblen;

The rejection of claims 14-20 over the claims of Shamblen in view of the UOC reference;

The rejection of claims 5, 11, and 12 over the claims of Shamblen in view of Ishibachi;

The rejection of claim 10 over the claims of Shamblen in view of Ishibachi and Armstrong;

The rejection of claims 21-23 over the claims of Shamblen in view of the UOC reference and Ishibachi;

The rejection of claim 13 over the claims of Shamblen in view of Ishibachi; and

The rejection of claims 24-26 over the claims of Shamblen in view of Ishibachi.

SUMMARY

For the reasons expressed above and in the Answer, we have sustained each of the rejections advanced by the Examiner in this appeal.

ORDER

The decision of the Examiner is affirmed.

Appeal 2008-4932
Application 10/814,896

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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